Contemporary problems of intergenerational relations
and pension systems:
a theoretical and empirical perspective

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THE MULTIDIMENSIONALITY OF INTERGENERATIONAL FAIRNESS: SOME CONCEPTUAL ISSUES

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Abstract
In this paper we try to identify the most important dimensions of intergenerational fairness perceived mainly through the prism of economics. To achieve this goal, we first identify a methodological and empirical gap in a multidimensional approach to the measurement and evaluation of intergenerational fairness. Then, we indicate and characterize the most important and obvious dimensions of intergenerational fairness. Since we are aware of the limitation that it is probably impossible to identify all the economic and social aspects in which intergenerational relations are reflected, we focus on those which are most addressed in the literature and can be measured or evaluated. These are: pensions, incomes, taxation and public debt, education, the labour market and healthcare. We can conclude that all these dimensions are closely related one to each other. Moreover, all of them are closely linked to the life cycle theory. An important feature of intergenerational relations is their time inertia, which means that present relations (e.g. distribution of GDP between generations) determine future relations. We also see some other important aspects of intergenerational fairness that were not discussed in our paper (natural resources, housing, migration). These can constitute the subject of further conceptual developments.

Keywords: equity, intergenerational fairness, justice, transfers, welfare.
JEL codes: D60, D63, J10.

1. Introduction
The deteriorating demographics in the developed world have raised many questions concerning the relations between generations living today (a chronological-temporal approach to defining generations, perceived as different age- or social groups living today) or between generation living today and generations that will live in the future (a chronological-intertemporal approach, see Tremmel 2014). These relations touch on many different aspects of economic and social life on the micro- (family, household), macro (economy, country) or even global (the world) level. In this paper, we try to identify the most important dimensions
of these relations in the context of intergenerational fairness perceived mainly through the prism of economics. To achieve this goal, we first identify a methodological and empirical gap in a multidimensional approach to the measurement and evaluation of intergenerational fairness. Then, we indicate and characterize the most important and obvious dimensions of intergenerational fairness. We are aware of the limitation that it is probably impossible to identify all the economic and social aspects in which intergenerational relations are reflected. Therefore, we focus on those which are most addressed in the literature and can be measured or evaluated. The paper ends with summary conclusion, also including directions for possible further empirical research in the field of intergenerational fairness. It should also be emphasized that the perspective we take in our considerations is the possibility to apply all the dimensions discussed in further research aiming at some cross-country comparisons in terms of multidimensional intergenerational fairness. This could contribute to the search for more effective welfare policies promoting intergenerational fairness instead of preferring (or discriminating against) selected generations.

2. Different approaches to intergenerational fairness: a literature review

The literature study supports the thesis that a multidimensional approach to intergenerational fairness is rather rarely addressed by investigators. This results from the fact that the majority of researchers focus on one very important dimension of intergenerational fairness, disregarding other dimensions. Such dimensions are first of all pensions and natural environment, sometimes healthcare, taxes, public debt, the labour market or education. Moreover, a one-dimensional approach is very often accompanied by a one-country approach. This means that a given country is investigated usually in terms of one or a few given dimensions of intergenerational fairness, while comparative cross-country studies of a multidimensional nature are much more rare. For review, Settergren (2003) addresses the problem of financial and intergenerational balance in the Swedish pension system in the face of intergenerational conflict. Osberg (1998) studies intergenerational fairness on the example of Canada. Mazzaferro and Morciano (2011) explore a similar issue on the basis of the Italian pension system, including not only intragenerational, but also intergenerational redistribution. Auerbach, Gokhale and Kotlikoff (1994) develop the concept and methodology of generational accounting to study intergenerational fairness. Their approach is widely applied by other authors, but has also some limitations (see e.g. Ruffing et al. 2014; Williamson and Rhodes 2011). Today, generational accounting is one of the main methodologies, along with overlapping generations models, serving for modelling intergenerational relations in economic terms. However, these methods, due to the fact that they require much detailed information and many assumptions concerning the future, such as e.g. demographics, the labour market, household behaviour, firm behaviour, governmental policy, or wages (see e.g. de la Croix et al. 2013) have the nature of simulations and are applied in studies usually concerning one country (Balestra and Dottori 2012; Boldrin and Montes
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2009; Hagemeyer et al. 2015; Kotlikoff 2004; Makarski et al. 2016; McCarthy et al. 2011; Sánchez-Romero 2013; Wrede 1999). The study by Libera (2006) is an example of a multidimensional approach to intergenerational fairness. She analyses the intergenerational equilibrium in terms of a pension system and other social transfers using generational accounting for Poland. The study also takes into account household savings and investments in education and health.

As we can see, the methodology of studies on intergenerational fairness prefers a one-dimensional or a one-country approach. In consequence, an important empirical gap in this field exists since there is a significant lack of cross-country comparative analyses of intergenerational fairness, especially in which not only the qualitative, but also a developed quantitative approach is applied. Apart from the studies on the generosity of European welfare states towards the elderly (Boersch-Supan and Nistico 2007) and IF European Intergenerational Fairness Index (Leach et al. 2016), which is a generalization (for European countries) of such an index calculated for United Kingdom (Leach and Hanton 2012, 2015), it is difficult to find any other studies evaluating intergenerational fairness in a broader international comparative context.

The literature review provokes a crucial question for the prospect of the development of investigations in the field of intergenerational fairness. Namely, is it possible to study this fairness on the basis of a set including many objects (countries) characterized by more than one aspect of intergenerational fairness? Such an approach would make it possible to achieve a more objective and robust evaluation of intergenerational fairness than those based only on one-country studies. Such an approach requires two assumptions. The first is that all the defined dimensions of intergenerational fairness under investigation are comparable across the countries discussed. The second is that statistical data describing each dimension are comparable across these countries. Such a multidimensional approach applied to many countries would have a very important application value since it would allow one to compare different models of welfare policy towards more effective intergenerational relations and more just division of wealth between generations, not only today but also in the future. Obviously, such a comparative approach has a relative nature since a given country, assessed as the best in terms of multidimensional intergenerational fairness, is actually the best one only in the set studied. This means that if the set of countries were completed with other countries, the country assessed as the best one could appear to be e.g. an average one in the extended set of objects. However, the intergenerational fairness is difficult to evaluate in absolute terms. To distinguish precisely between fair and unfair policies or between acceptable and unacceptable values of given indicators characterizing intergenerational fairness, is very difficult. That is why studies based on many countries can give more objective and robust results.

In cross-country studies, all the objects are compared to each other which, in fact, means being compared to an internal benchmark (the best object in terms of intergenerational fairness), to anti-benchmark (the worst object), or to a hypothetical benchmark (e.g. having average values of all the indicators of
intergenerational fairness). To reduce the negative aspects of such relativity and minimize the risk of bias of the set (sample), the countries selected should be diversified in terms of the intergenerational fairness and their number has to be sufficient. Since in terms of international comparisons data availability limits the number of countries that can be investigated, a number exceeding ten is very often satisfactory. Comparisons based on such sets of objects can give highly objective and universal results and conclusions, especially as compared to one- or two-, or even several-country studies. The next section of this paper aims at identifying the dimensions of intergenerational fairness that could be mentioned in cross-country comparisons.

3. Dimensions of intergenerational fairness

Before we discuss the dimensions of intergenerational fairness, it is necessary to present briefly an important assumption concerning our view on this fairness. Since this paper constitutes the continuation of considerations presented by (Chybalksi et al. 2018), we perceive intergenerational fairness as “such relations between different age (or social) groups which do not discriminate against any age group in terms of its present and future living situation”. This definition has the following consequences. Intergenerational relations refer not only to present transfers (today) between different age groups (a chronological-temporal approach to generations) but also to their impact on prospects (future). Thus, intergenerational fairness should not be evaluated only through the prism of the contemporary situation but with reference to the foreseeable future as well. This is quite consistent with Tremmel's (2014) view on intergenerational justice: “Is it unjust that the old generation is normally wealthier than the other two generations? Not necessarily, unless young people have no chance to be in the same situation when they grow older. The crucial question is whether young people will attain the same wealth as senior citizens, once they have reached their age.” Obviously, the direct comparisons of different generations (perceived as different age groups) are unjustified in terms of wealth which is a simple consequence of the differences in the period of wealth accumulation. This results e.g. from life cycle hypothesis, according to which people smooth consumption through saving. They accumulate wealth to consume after they will stop working and retire (Ando and Modigliani 1963; Modigliani and Brunberg 1954). Nevertheless, as emphasized by Barr and Diamond (2006), future GDP is crucial for pensions since future pension benefits will be paid from the future GDP. Thus, current GDP division between generations is crucial for future GDP. Therefore, it is unjustified to compare the wealth of the old and young, nevertheless the current division of incomes between these age groups determines the prospects the young generation have for the future and, as a consequence, their chance to accumulate wealth comparable to that accumulated by their parents. This perspective allows us to identify the most important dimensions of intergenerational fairness.

The results of the initial literature review suggest that the following dimensions of intergenerational fairness seem to be the most important (Aydede 2010; Balestra and Dottori 2012; Beetsma and Oksanen 2007; Boldrin and Montes 2009;
Leach and Hanton 2012, 2015; Tremmel 2014; von Weizsäcker 1995; Wrede 1999): pensions, incomes, taxation, the labour market, education, and healthcare. Climate change is also an important aspect of intergenerational fairness, especially from the youth point of view, since this change is slow but steady and may deteriorate their quality of life over their life cycle. However, we do not address this issue in our paper since climate change is very often discussed in the literature and is more ecology than an economic aspect of intergenerational fairness; however, it constitutes an important dimension of sustainable development. We also find migration to be a very important element of the analysis of intergenerational fairness. However, migration is rather not a (direct) dimension, but a side effect of intergenerational fairness (or unfairness). People, especially the young, who are more mobile, can seek for a better paid job in other countries if wages in their country are not satisfactory, e.g. due to a high tax wedge, resulting from a significant spending on pensions. The openness of labour markets in Europe stimulates this labour force migration.

3.1. Pensions

Pensions are an obvious dimension of intergenerational fairness which results from a macroeconomic definition of a pension system, perceived as a tool for dividing current GDP between generations, but also determine the prospects for young people for the future, since division of current income determines its magnitude and division in the future (see Barr and Diamond 2006; Góra 2008). As a result, pensions are probably the most frequently addressed issue related to intergenerational relations in many aspects. The first aspect refers to retirement age and early retirement as a tool of full employment policy. This policy was initiated in the period of stagnation and long-term unemployment in the 1970s and 1980s, especially in Continental Europe. However, this policy turned out to be ineffective since it did not reduce unemployment among the young through decreasing the effective retirement age (Chybinski and Marcinkiewicz 2014; Gruber et al. 2009; Jousten et al. 2010; Kalwij et al. 2010). The consequences of this policy are very long-term, since twenty years later, many countries have problems with increasing the statutory retirement age as a simple effect of the extension of life expectancy. Although economic and demographic premises undoubtedly indicate that the effective retirement age should be increased, also through a higher statutory age, political willingness to do this is very weak, which results from the growing power of the elderly electorate and the shrinking youth electorate. The intergenerational dimension of a pension system refers not only to the present time (GDP division and transfers from the middle-aged to the old) but also to the future, as present GDP division affects savings and investments and, as a result, future GDP. Many forecasts suggest unambiguously that today’s young workers will have incomparably lower pension benefits than today’s pensioners. Another issue concerning the pension dimension of intergenerational fairness is implicit debt, which arises especially during pension reforms involving the replacement of a PAYG scheme with a funded one. If a given part of pension contribution is directed from PAYG to a funded part, a financial imbalance may
be generated in the PAYG scheme, since present contributions do not balance present benefits (pensions in payment). In such a case, three main policies may be implemented: increasing taxes, reducing other public spending or borrowing from the future (through issuing public bonds). The last option means actually charging the young generation with the cost of reforms. The transformation cost, if financed through explicit debt (public bonds), increases the risk of not paying off an implicit debt in PAYG scheme, since these liabilities are not due and payable until young generation will retire. Unbalanced public budget policy increases the risk in a public PAYG pension system, which actually is based on the political promise to pay benefits in the future. As a result, policymakers may consider replacing earnings-related pension schemes or defined contribution schemes with flat-rate pension benefits, which would in fact mean a part cancellation of an implicit debt to the young (or people working today).

3.2. Incomes

Incomes, as opposed to wealth, can be used to compare the living standard of different age groups, which means intergenerational comparisons in chronological-temporal terms. Wealth can be used only when generations perceived as similar age groups living in different periods of time are compared (a chronological-intertemporal approach). This results from the fact that income is a stream, whereas wealth is a resource (accumulated over the life cycle). We mainly focus on a chronological-temporal approach, since it is more feasible to compare different age groups living today than the same age groups living in different periods of time. What matters in this case is comparative cross-country data availability. Income, as one of the dimensions of intergenerational fairness, has to be treated in a wide sense and include different measures like those referring to poverty, income inequalities, average or medium incomes etc. Focusing only on e.g. median income as Leach and Hanton (2012, 2015) do, is a far-reaching simplification, since median or average income measures do not account for income inequalities. As a result, it does not give any picture of poverty or income distribution among different age groups. The comparison of incomes across different age groups should be conducted with reference to the present and future (expected) situation. Today’s incomes can be treated not only as a measure of current living standards but also as a predictor of the future living standards of people at working age or youth. Current incomes determine the ability of the working generation to save and to invest in their children, especially when government spending on education is low and does not allow young people to achieve a competitive level of knowledge and skills. In such cases, intra-family transfers are used to mitigate ineffective state education policy. Moreover, government policy in the field of income redistribution also matters. Transfers directed to poor families with children reduce the inheritance of economic status through increasing the investment in human capital across poor households (Cooper 1998; Li et al. 2014). This fact supports the thesis that income as a dimension of intergenerational fairness should be perceived as a complex
measure instead of as a simple one (e.g. median income). Income inequalities and poverty matter as well.

3.3. Taxation and public debt

Public debt represents a commitment by taxpayers in the future to make payments for goods and services that have been supplied in the present (EEAG Report 2016). Consequently, debt should be used for investments (e.g. in infrastructure) that will benefit future citizens, although this means greater future burdens (debt repayment). So, the intergenerational effects would be strongly negative due to the long-term growth of taxation that are to be paid by non-borrowers of financial resources (Lucian 2013). In addition, the effect that taxation probably causes on future generations is the reduction of private consumption, so then two types of debt must be distinguished: i) the costs of current needs that must be covered by the current generation; and ii) the accumulated capital expenditure that must be covered at the time the benefits are produced, which is the one that will be inherited through high taxation by future generations. Krugman (1988) calls this “debt overhang”.

Following Bangham, Finch and Phillips (2018), the future average expenditure on welfare state services – health, education and social security – depends on the age of the individuals. It will be the working-age population who will pay for these services. The maximum financial burden is incurred on the age group 40-50. After that age, the burden will decrease until it reaches a low level during the retirement period. However, there is an increase in the expenses in healthcare provision for the latest years of life. This distribution of expenses and taxation is based on the life-cycle perspective that makes the generosity of the welfare state among the different generations more understandable.

Regarding the evolution of public debt as the ratio of GDP, since the recession of 2008 it has increased in recent years in the European countries. In 2016, the average public debt for EU-28 was 85% of GDP, 27 percentage points higher than in 2007. Likewise, the public debt per worker has increased since 2008, reaching its maximum in 2014 (Hanton 2016). In this sense, the high level of public debt is important regarding intergenerational terms because it represents the economic cost that future generations will have to face. Therefore, those cases in which the public debt is excessively high will damage the living standards of the youngest cohorts. According to Lucian (2013), the impact of taxation and public debt should be distributed fairly between generations, including the PAYG public pension system. On the other hand, the level of public debt is closely related to fairness and improvements in the labour market due to the fact that: i) an increase in productivity would decrease the ratio between public debt and GDP, and ii) because an increase in the number of workers in the economy would cause a fall in public debt per capita.
3.4. Education

The intergenerational equity of education seems to be an obvious postulate whose realization determines whether young people get access to better education through investments made by the working-age population in human capital development. Possible burdens on education spending charge middle-aged cohorts which are under-educated and have fewer competitive skills when entering the labour market. The financing of education is based on what is known as the implicit commitment (social contract) that the younger generations, once they complete their training, contribute to the system through their participation in the labour force and in production. Improvements in education financed by the government through taxation of the working-age population but also pensioners impacts the young workforce productivity which stimulates GDP growth and the future product. Therefore, investment in education and economic growth are correlated (Bajo 2005).

Investment in education depends on the policies implemented by the government. Such policy can change over time as politicians in power change and political goals evolve. Moreover, the political time-perspective is usually shorter than the economic one. As a result, cyclical decreases (underfunding) in investment in education are possible and may cause worse future job prospects for younger people relative to older workers who will obtain better wages and, as a result, will be paid higher pension benefits as compared to the younger generation. The relation between intergenerational fairness in education and the labour market is evident and affects even a pension system. In a three-period overlapping generation (OLG) model with a PAYG pension system, the working-age generation is willing to invest in education of the young generation and expects to be paid pension benefits in the future (after retirement) when the young generation will become the working-age generation (and will finance the pension benefits of their parents). Thus, in such a model pensions can be perceived as a form of return on the investment in education. These relations result from an implicit intergenerational contract which is actually based on reciprocity or even a promise (Richman and Stagner 1986; Boldrin and Rustichini 2000; Boldrin and Montes 2005, 2009).

3.5. Labour market

Intergenerational fairness also means that the different generations of workers receive a fair proportion of the total remuneration of the work as one of the production factors (European Commission 2017a). Therefore, economic growth is transferred to improvements and more competitive labour markets, from which society has the capacity to create new opportunities for future generations. According to the characteristics of the current and future labour market, the average activity rate (73% in 2016) in the European Union shows an upward trend, with an employment rate representing 71.1% of the European population (European Commission 2017a). However, there are important differences across countries in terms of the age- and gender structure of participation in the labour
force. Despite the fact that the employment rate for females has increased significantly in recent years, the wage gap still persists — males’ wages are 16% higher in average terms. Regarding the age groups, the employment rates of older men and women have been increasing. For older workers (55-64 years old), the employment rate in the EU equalled 55.3% in 2016. This represents an increase of two percentage points as compared to 2015. Nevertheless, the employment rate of older workers is still 23.5 percentage points lower than in the case of people aged 25-54. Older workers (aged 55-64) accounted for 16.9% of total employment in the 20-64 age group in 2016. According to projections, this proportion will rise to 19.5% in 2060, which will be the result of an ageing population, including the workforce (European Commission 2017a). Although in the last three years there have been significant improvements in the employability of the youngest (15-24 years old) and least qualified, this age group has been the most affected by the economic crisis, which is reflected in very high unemployment rates, especially in countries like Greece and Spain. In 2016, the youth unemployment rate in EU fell to 18.7% in average terms. Although the trends are optimistic, the impact of the crisis is likely to have reinforced generational inequalities implied by long-term structural changes in European economies. The high youth unemployment has severe implications for the future situation of young people and their households, concerning e.g. lower salaries and lower financial stability. They are also more likely to accumulate less pension wealth and other savings. Moreover, the inferior economic situation can affect also their housing condition (lower home ownership rates).

The labour market flexibility can yield greater benefits and be more effective in terms of reducing the exclusion of young people from the social contract through a more effective and better financed education system, which is crucial for workforce competitiveness and productivity. However, on the one hand, low qualifications can cause high youth unemployment. Unemployment causes a decline in economic growth and, therefore, also in investment in education. On the other hand, there are agents who present "over-qualification" in relation to the demands of the labour market, which implies the inefficient use of qualifications, skills and knowledge. Consequently, it can be affirmed that the labour market inevitably becomes an element of pressure on the educational system and educational policies. The efficiency of this policy affects intergenerational relations. Regarding the relationship between the labour market and pension system, pension system and labour market reforms undertaken in recent years in many countries, as well as recommendations made by institutions such as the OECD or the European Commission, highlight the need to encourage "active aging". The main goal is to postpone retirement and extend the duration of working life. This is consistent with the idea of fair responsibility of different generations for the process of ageing population and, as a result, affects intergenerational fairness.

3.6. Healthcare

Healthcare presents two peculiarities to question the intergenerational fairness; on the one hand, the increase in health spending varies by age, and, on the other hand,
healthcare is heavily subsidized by government, contributions or taxes. People
would either consume less when they are young in order to finance healthcare
when they are older, or they would spend more on healthcare and less on other
goods when they are older (Sheiner 2009). As some researchers claim (Sheiner
2009, Corak et al. 2005), the working-age population is the one that finances
health expenditures while the greater benefits occur during old age. However, the
difference between spending on pensions and healthcare is obvious. The former
is devoted only to the generation of pensioners, whereas the latter is for all
generations (from the youngest to the oldest).
Due to the aging population, an increase in life expectancy and technological
development, most medical expenses occur in the last years of life (EEAG 2016),
so similarly to old-age pensions, the public healthcare system allows old age
agents to be independent (or at least independent to a significant degree) of their
families. The combination of pension and medical benefits, which are ensured for
the whole old-age period (like life annuities), allowed people to preserve larger
shares of their accumulated assets (including e.g. home ownership, other durable
goods). According to Bangham, Finch and Phillips (2018), a continuous increase
in the cost of healthcare for each generation is noteworthy. Health spending was
9% of GDP on average in the OECD countries in 2016, ranging from 4.3% in
Turkey to 17.2 in the United States (OECD 2017). According to the forecasts of
the European Commission (2017b), healthcare costs will continue to grow, faster
than revenues to the healthcare systems and GDP (providing a stable level of the
system’s generosity). This means that the young cohorts will have to pay for the
future increase in spending on healthcare. These are the same cohorts which have
experienced very high unemployment rates.

4. Summary
Intergenerational fairness expresses the degree to which a society is capable of
generating and distributing well-being among all its members (Sánchez-
Santamaría and Manzanares 2012). Ensuring intergenerational fairness is one of
the greatest challenges the European countries have to face today. The ageing
population has important implications for economic growth and the fair
distribution of resources between generations. The long term socio-economic
policy developed and implemented by governments has to account for a possible
intergenerational conflict. Its goal should be to minimize the likelihood of
this conflict and the tool to achieve this is to build a long-term and fair
intergenerational contract. This means not to discriminate against any generation
in favour of another. A fair intergenerational policy needs references to many
dimensions, from which the most obvious in economic terms seem to be: pensions,
income, taxation and public debt, education, labour market and healthcare. In this
paper, we focused on these dimensions of intergenerational fairness and tried to
justify them as well as to indicate their meaning in creating a fair intergenerational
policy. We can conclude that all these dimensions are closely related one to
each other. Moreover, all of them are closely linked to the life cycle theory.
Intergenerational relations in the future are to a large extent determined by
contemporary intergenerational relations. The distribution of resources between generations today affects what will be distributed tomorrow. Unfair distribution of current GDP will have its consequences in the future and any mitigation of these negative consequences will be very difficult in the short period since the economic situation of a given generation is the result of the intergenerational game, which has a zero-sum result in the short-term perspective. Thus, the inertia of intergenerational relations is very strong which means present relations determine future relations. This means that the future situation of young generation is shaped today.

We also see some other important aspects of intergenerational fairness that were not discussed in our paper, which however can constitute the subject of further conceptual developments. The first one is natural environment, which is more an ecological than an economic notion, but is nevertheless strongly embedded in sustainable development theory. The second one is housing, reflected e.g. by home ownership rates across different generations. As we mentioned before, migration is also an important aspect of intergenerational fairness; however, we perceive it more as a side-effect of intergenerational relations than a dimension of them. People emigrate to seek better jobs and higher incomes.

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